

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

COTILE LAKE

**WATERBODY EVALUATION &
RECOMMENDATIONS**

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

March 2014 – completed by

Richard Moses, Biologist Manager, District 3

Richard McGuffee, Biologist Supervisor, District 3

Shelby Richard, Biologist II, District 3

The remainder of this page intentionally left blank.

TABLE OF CONTENTS

WATERBODY EVALUATION.....	4
STRATEGY STATEMENT	4
<i>Recreational.....</i>	<i>4</i>
<i>Commercial</i>	<i>4</i>
<i>Species of Special Concern.....</i>	<i>4</i>
EXISTING HARVEST REGULATIONS	4
<i>Recreational.....</i>	<i>4</i>
<i>Commercial</i>	<i>4</i>
SPECIES EVALUATION.....	4
<i>Recreational.....</i>	<i>4</i>
<i>Species of Special Concern.....</i>	<i>12</i>
HABITAT EVALUATION	12
<i>Substrate</i>	<i>12</i>
<i>Artificial Structure.....</i>	<i>13</i>
CONDITION IMBALANCE / PROBLEM	13
CORRECTIVE ACTION NEEDED	13
RECOMMENDATIONS	14

WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species, primarily largemouth bass, are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest adequate numbers of fish to maintain angler interest and efforts.

Commercial

Cotile Lake has relatively infertile water that is not conducive to the production of commercial fish species. A commercial fisheries management strategy is not used.

Species of Special Concern

No threatened or endangered fish species are known to inhabit this waterbody.

EXISTING HARVEST REGULATIONS

Recreational

Statewide regulations for all fish species, the recreational fishing regulations may be viewed at the link below:

<http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

The commercial fishing regulations may be viewed at the link below:

<http://www.wlf.louisiana.gov/fishing/regulations>

Rapides Parish Ordinance Article I, Section 19.5 -1. Rules and Regulations for Recreational Areas: Part B (4) b3. – prohibits the use of fishing nets, seines, slat traps or similar devices. The complete Rapides Parish Ordinance can be viewed at the following link. This regulation is not a state law thus it cannot be enforced by the LDWF enforcement division personnel. It is enforced by the authority of the local Rapides Parish Sheriff's Office.

<http://library.municode.com/index.aspx?clientId=10429>

SPECIES EVALUATION

Recreational

Largemouth Bass

Largemouth bass (LMB) populations are targeted for assessment because they are a species indicative of the overall health of the fish population due to their high position in the food chain. Electrofishing is the most efficient sampling method for collecting largemouth bass to evaluate abundance and size distribution, with the exception of large bass. Gill net sampling is generally the preferred method to determine the status of large bass and other large fish species.

Relative abundance, length distribution and size structure indices

Electrofishing has been used to collect largemouth bass population data in Cotile Lake since 1998. Springtime electrofishing results were used as an indicator of largemouth bass relative abundance. Total catch-per-unit-effort (CPUE) since 1998 is shown in Figure 1. Sampling was conducted in the spring and fall on a bi-annual basis from 1998 through 2009 and again in 2013. Data presented in Figure 2 indicates varying trends in CPUE for all largemouth bass size groups. However, the overall trend from 2000 through 2009 indicated an increase in LMB abundance. The increase is likely due to fall/winter drawdowns in 2000 and 2007. Prior to the drawdown in 2000, the lake had not been drawn down since 1987. The drawdown may have improved the predator/prey balance, improved spawning substrate, and increased available nutrients.

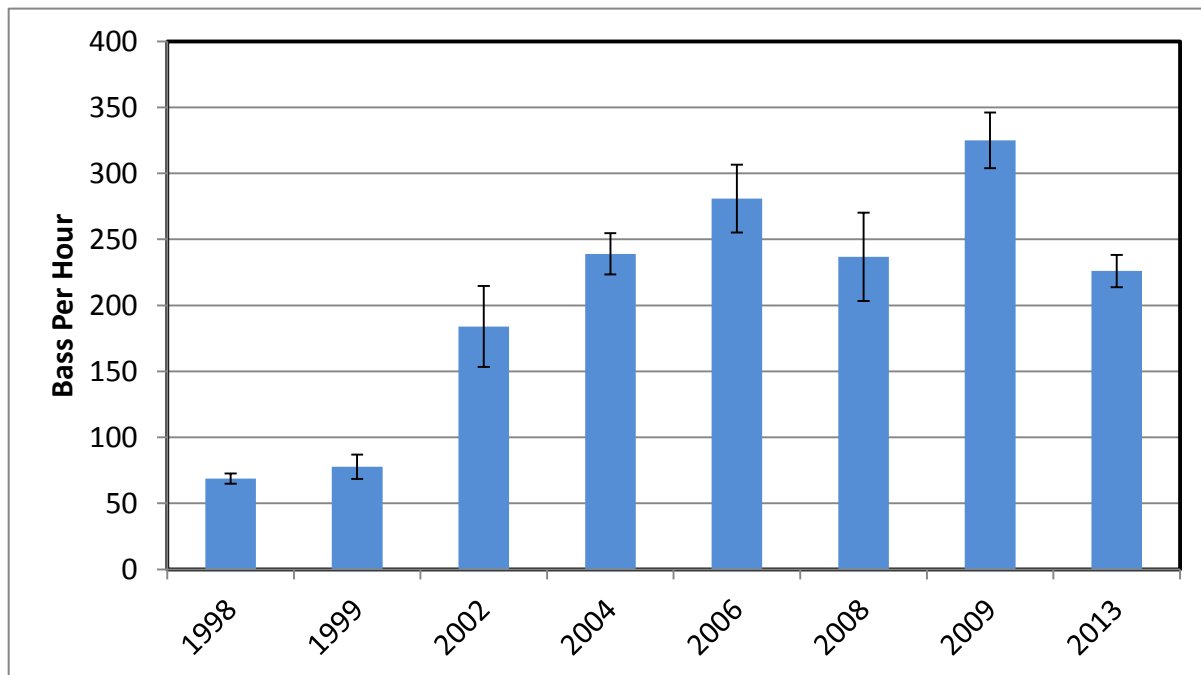


Figure 1. The total CPUE (\pm SE) for largemouth bass collected during spring electrofishing on Cotile Lake, Louisiana 1998 – 2013.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data. Proportional stock density compares the number of fish of quality size [greater than 12 inches total length (TL) for largemouth bass] to the number of bass of stock size (8 inches TL). PSD is expressed as a percentage. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish.

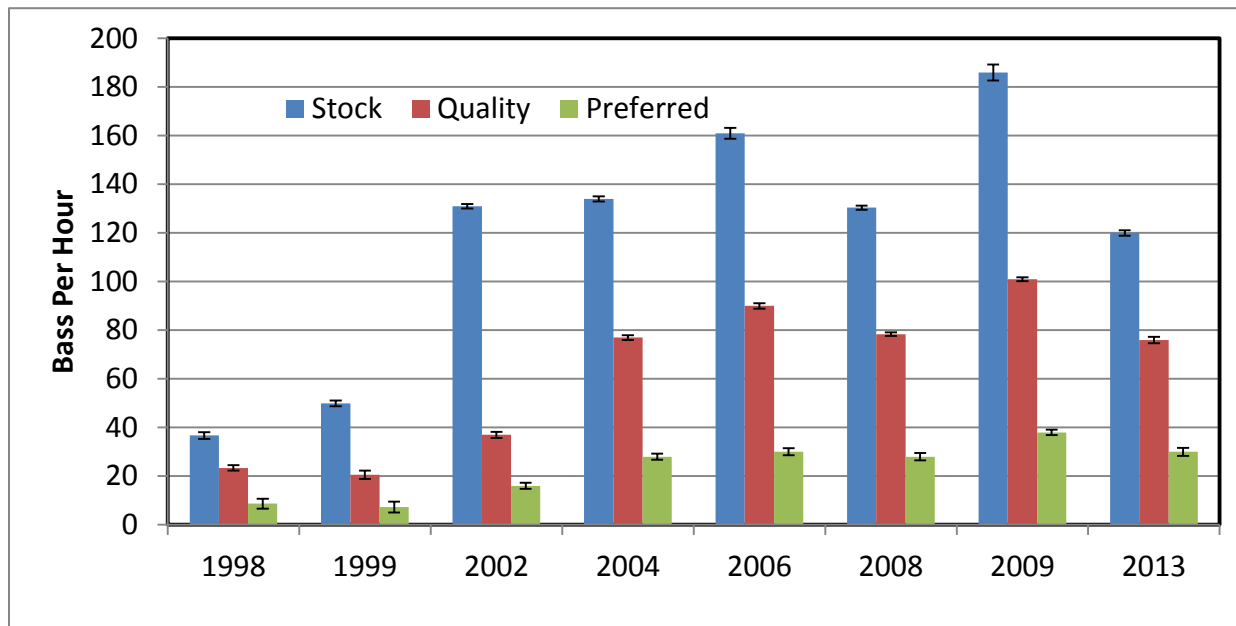


Figure 2. Mean CPUE (\pm SE) for stock-, quality-, and preferred-size classes of largemouth bass collected during spring electrofishing on Cotile Lake, Louisiana 1998 – 2013.

For example, Figure 3, indicates a PSD of 60 for 2008. This value suggests that 60% of the stock-size bass (fish over 8 inches) in the sample were at least 12 inches or longer. Generally PSD's between 40 and 60 are considered good for central Louisiana lakes.

$$\text{PSD} = \frac{\text{Number of bass } > 12 \text{ inches}}{\text{Number of bass } > 8 \text{ inches}} \times 100$$

Relative stock density (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches or longer.

$$\text{RSD} = \frac{\text{Number of bass } > 15 \text{ inches}}{\text{Number of bass } > 8 \text{ inches}} \times 100$$

Trends in largemouth bass structural indices indicate that PSD and RSD values have remained relatively stable from 2004 through 2013. This may be expected in upland reservoirs with relatively infertile water and stable habitat.

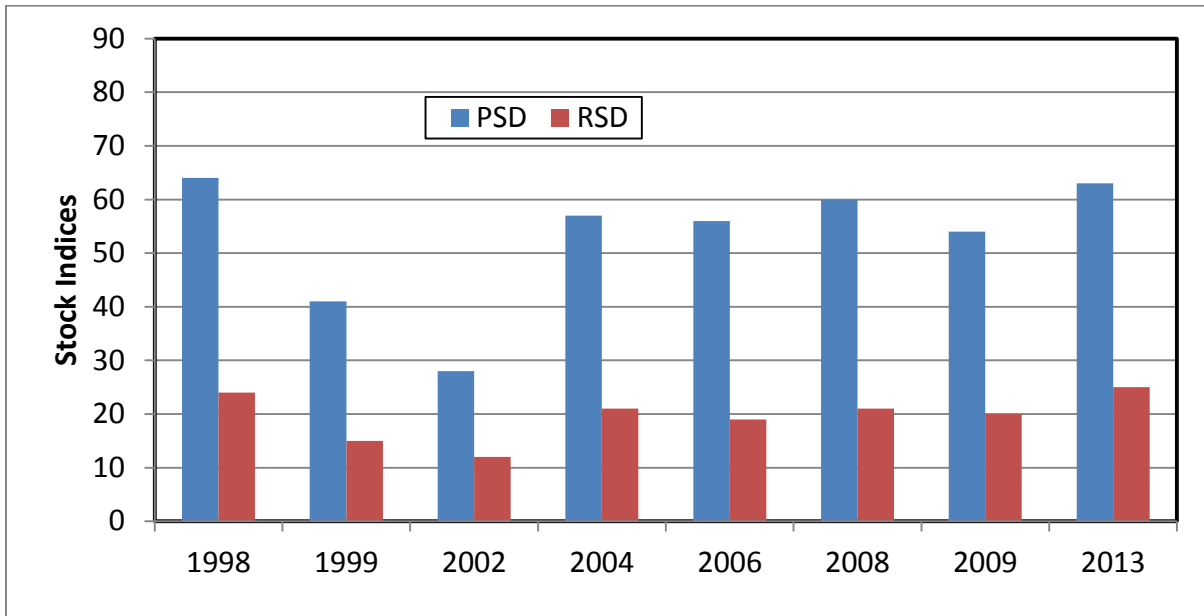


Figure 3. The size structure indices (PSD and RSD-p) for largemouth bass collected during spring electrofishing on Cotile Lake, Louisiana from 1998 – 2013.

Length distribution data for largemouth bass collected during spring and fall electrofishing in 2013 is presented in Figure 4. Largemouth bass ranged from 3 to 20 inches in total length (TL) with the most abundant group being 12 inches TL. Based on previous growth rates, LMB in the 4 – 7 inch groups are typically young-of-the-year (YOY) and age 1+ recruits. This length distribution indicates a balanced population of LMB with all size classes represented. The numbers of young bass in the sample indicate that adequate reproduction is occurring in Cotile Lake.

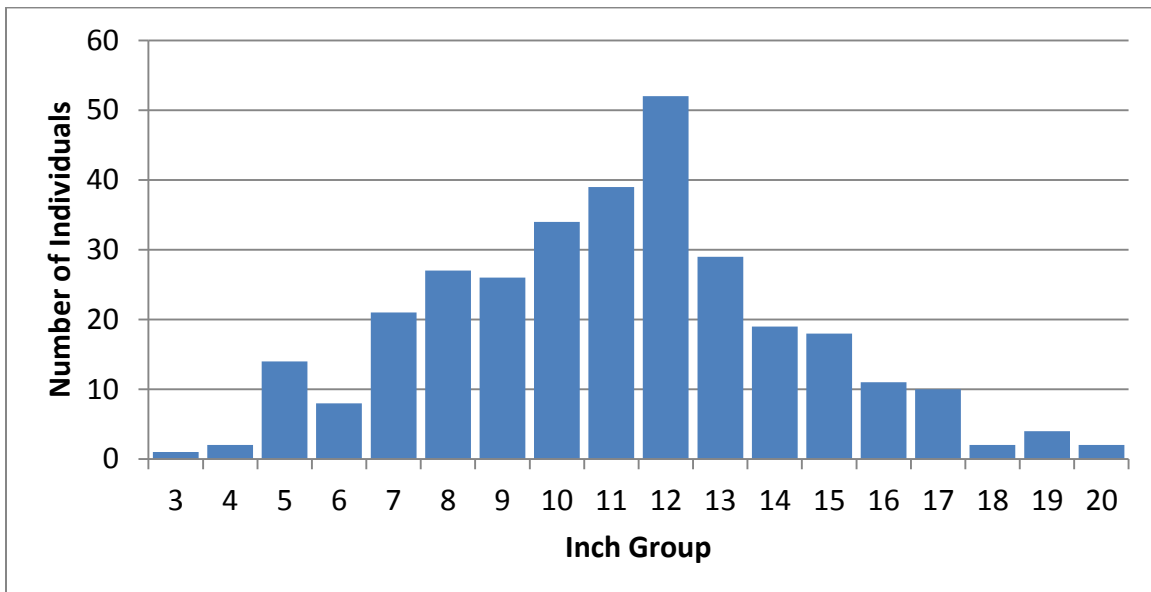


Figure 4. The length distribution for largemouth bass collected during spring and fall electrofishing samples on Cotile Lake, Louisiana in 2013 (n = 319).

Largemouth bass age and growth

Age and growth data were collected from 67 LMB in the fall of 2008. The results of these samples are listed in Figure 5.

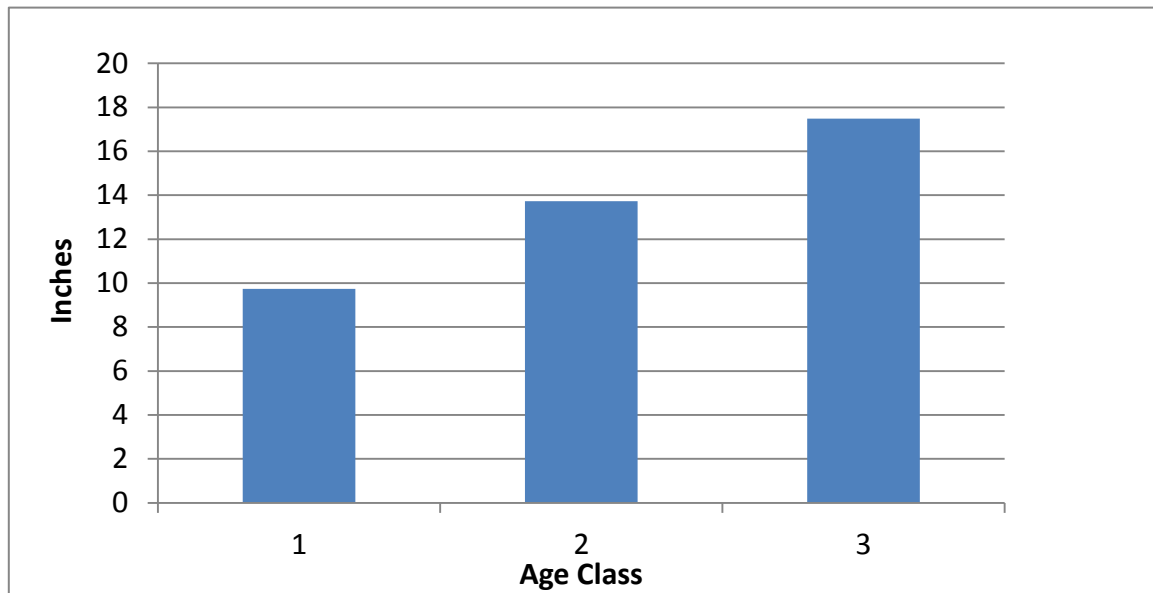


Figure 5. Average length at age of capture for largemouth bass in Cotile Lake, Louisiana 2008 (n = 67).

Forage

Forage availability is measured through two methods: summertime shoreline sampling with haul seines and fall electrofishing. Shoreline seining results are displayed in Figures 6 and 7. The two major fish groups represented in the forage samples were sunfishes and silversides. Forage availability is also measured indirectly through measurement of largemouth bass body condition or relative weight. Relative weight (W_r) is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length and multiplying the quotient by 100. Largemouth bass relative weights below 80 may indicate a potential problem with forage availability. The relative weights of LMB collected from Cotile Lake have been relatively stable for all size classes since 1998. Relative weights of LMB from Cotile Lake are within an acceptable range (Figure 8).

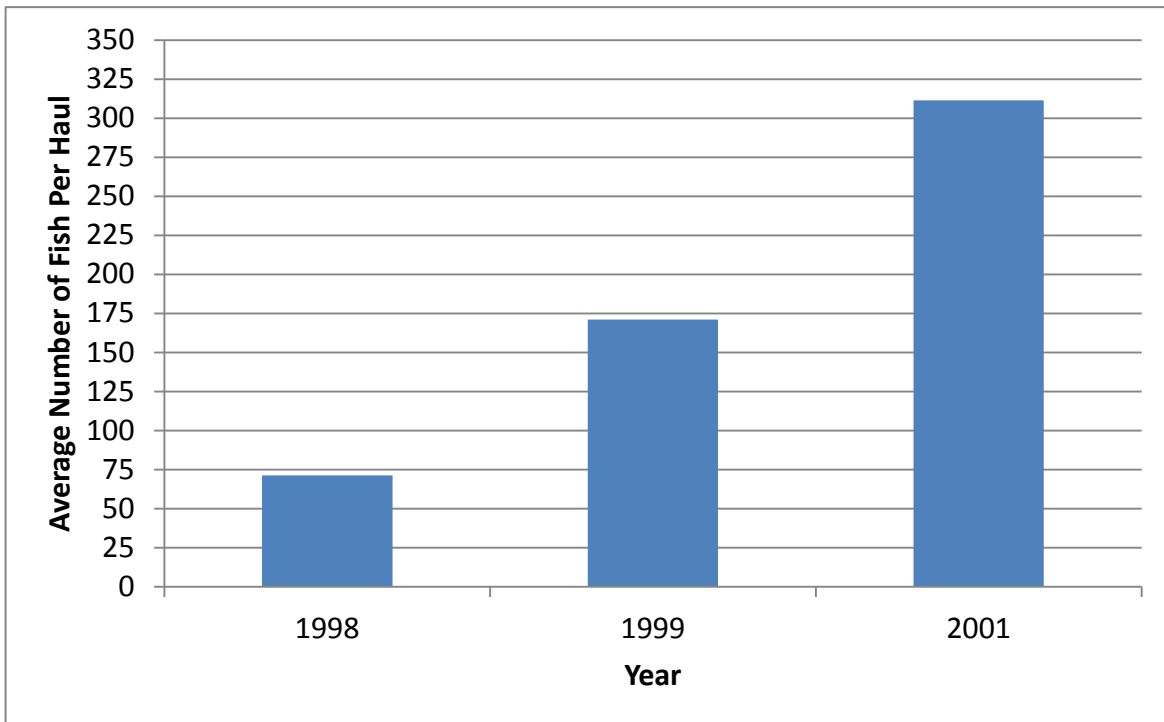


Figure 6. CPUE (average number per seine haul) of fishes collected during shoreline seining at Cotile Lake, Louisiana for 1998, 2000, and 2001.

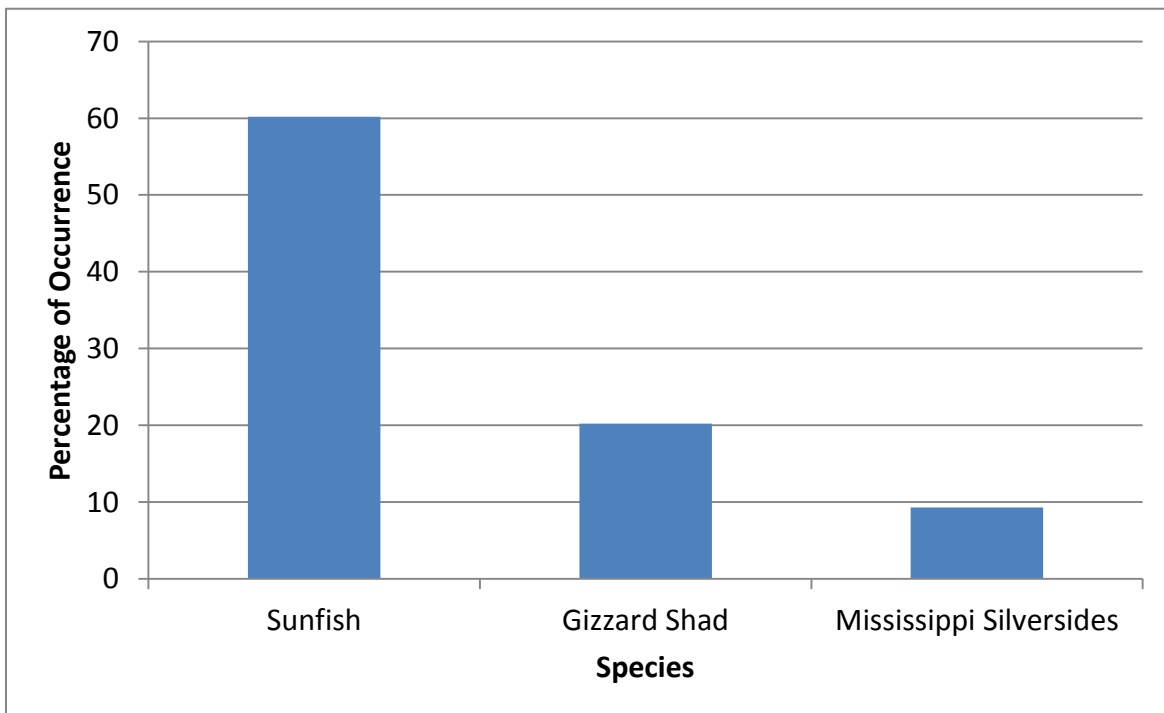


Figure 7. Percent frequency of occurrence for forage species collected during fall electrofishing on Cotile Lake, Louisiana in 2013.

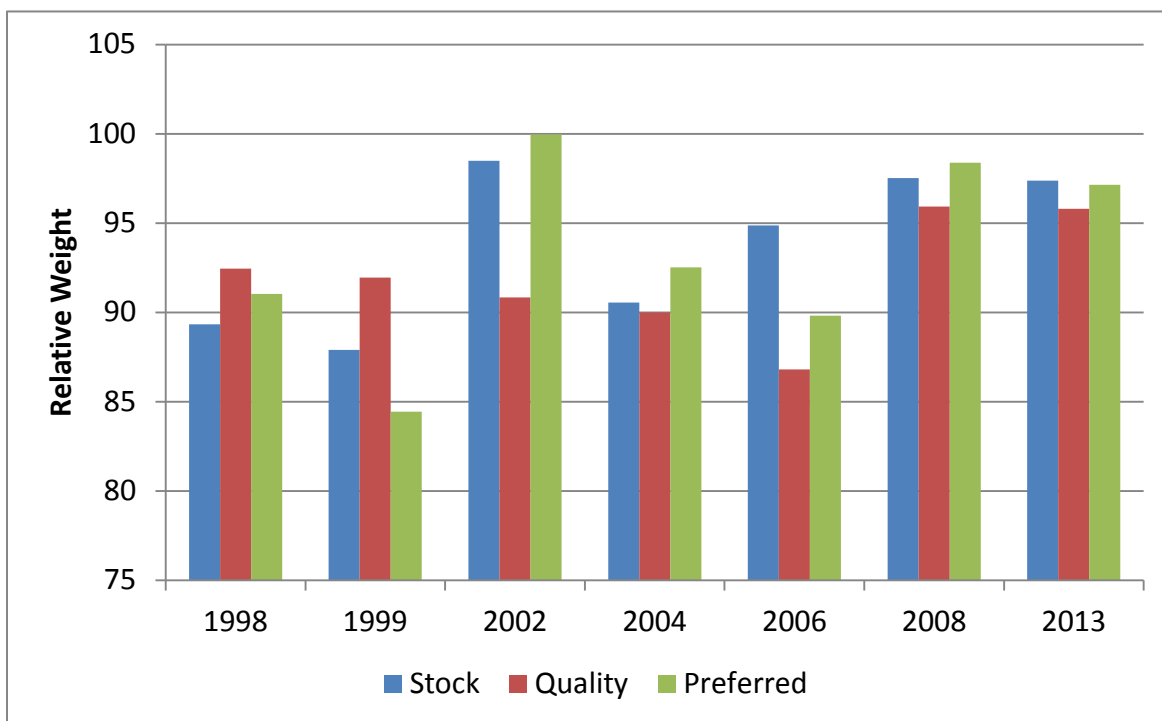


Figure 8. Relative weights for stock-, quality-, and preferred-size classes of largemouth bass collected during fall electrofishing on Cotile Lake, Louisiana from 1998 – 2013.

Largemouth bass genetics

Florida largemouth bass (FLMB) stockings have had little impact in Cotile Lake. Stockings were conducted in 1994-1996, 1999-2003, 2007-2008, and 2013-2014. Genetic analysis was conducted on largemouth bass samples in 2006 and 2008 (Table 1).

Table 1. Largemouth bass genetic testing results for Cotile Lake, Louisiana from 2006 and 2008.

Year	% Northern	% Florida	% Hybrids	Total FLMB Influence %
2006	86 (n=60)	0	14 (n=10)	14
2008	89 (n=68)	0	11 (n=8)	11

Crappie

Cotile Lake supports a population of both black and white crappies. The sampling results below group black and white crappie data. Historical biomass (rotenone) sampling results from 1969 through 1998 indicated a good crappie abundance for the relatively infertile upland impoundment. Standing crop estimates ranged from 1 pound per acre in 1975 to 20 pounds per acre in 1986. Overall, Cotile Lake averaged 6.6 pounds of crappie per acre (Figure 9). Additional sampling for crappie was conducted with lead nets in 2009 and 2010. The results indicated a crappie population similar to other clear, infertile central Louisiana impoundments (Figure 10).

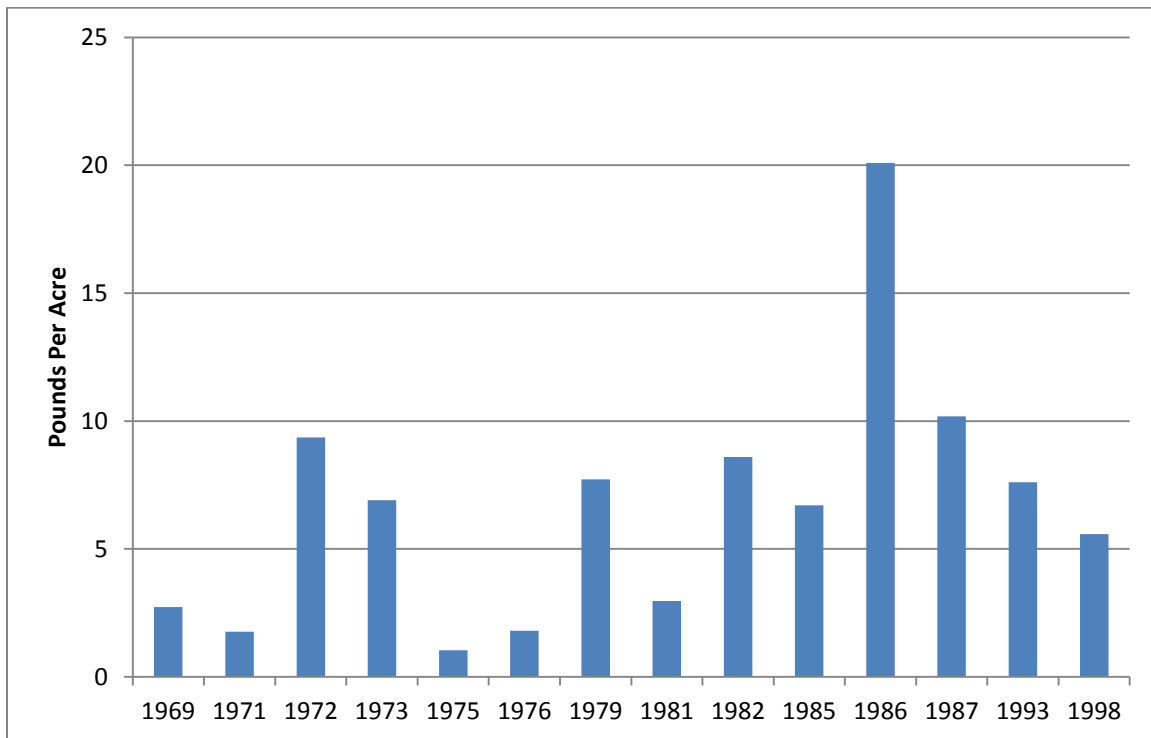


Figure 9. Standing crop estimates (lbs./acre) for crappie collected via rotenone sampling from Cotile Lake, Louisiana from 1969 through 1998.

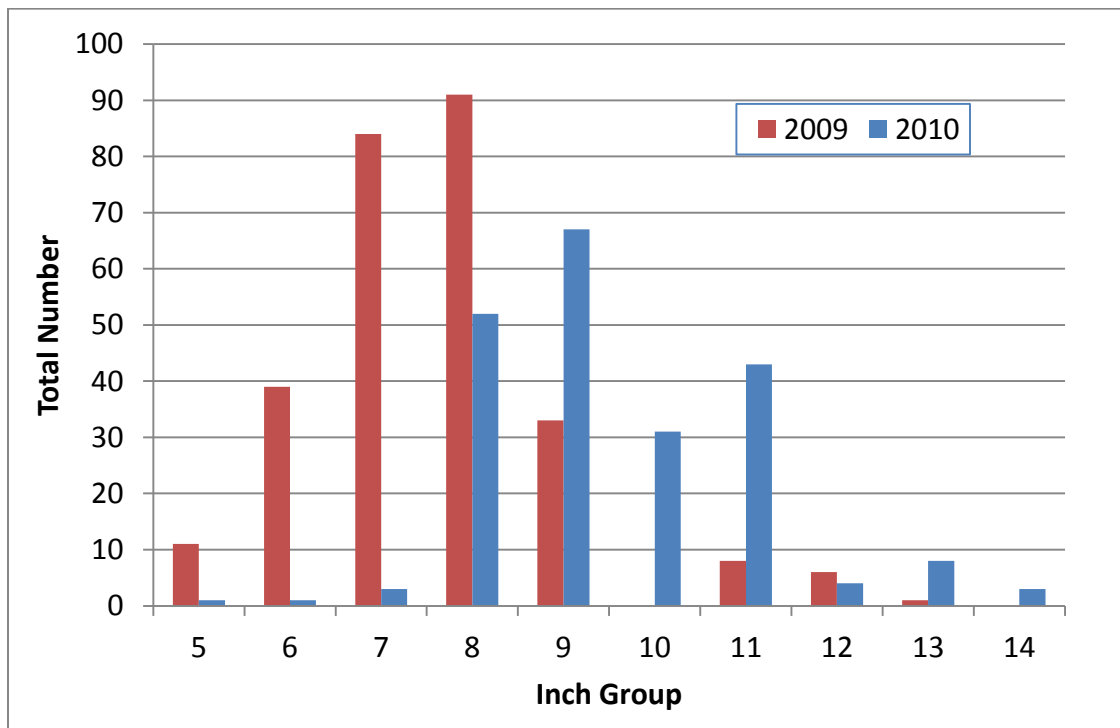


Figure 10. Crappie length distributions from fish collected during lead net sampling in Cotile Lake, Louisiana in 2009 and 2010.

Commercial

Large rough fish species that normally comprise a commercial fishery are not present and a viable commercial fishery does not occur in Cotile Lake. Gill net sampling was conducted in 2004, 2006 and 2008 (Figure 11). Channel, blue and flathead catfish were the only commercial species collected.

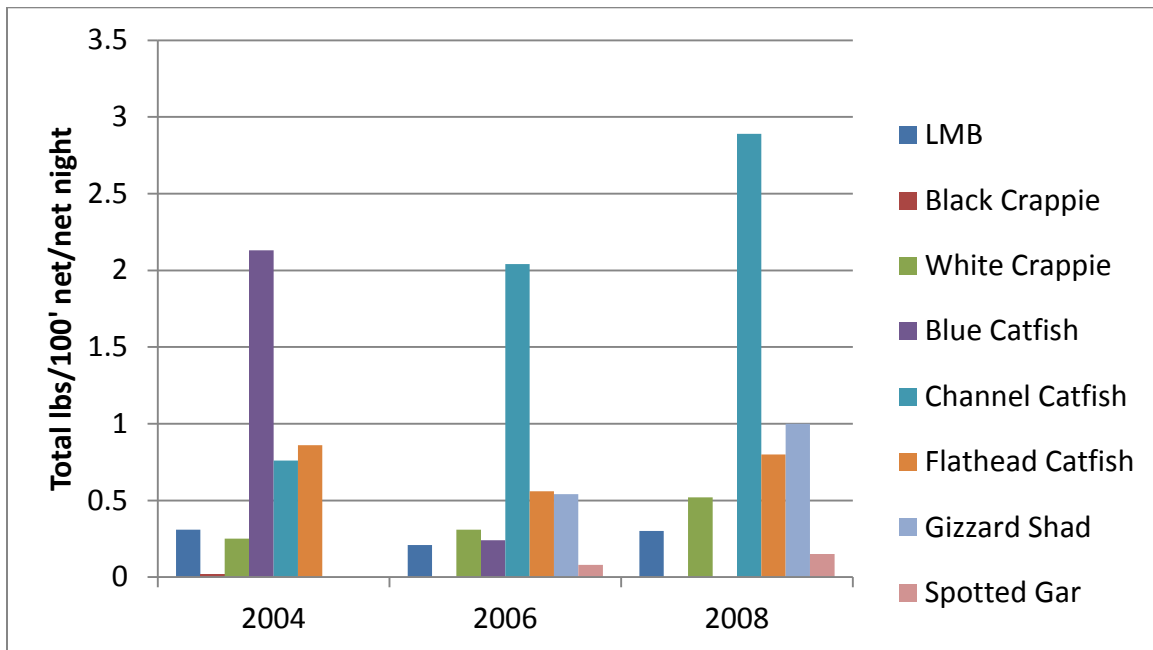


Figure 11. Total CPUE (in pounds per net night) by species by year for Cotile Lake, Louisiana, collected with standardized gill nets in 2004, 2006 and 2008.

Species of Special Concern

No threatened or endangered fish species are known to occur in Cotile Lake.

HABITAT EVALUATION

Aquatic Vegetation

Cotile Lake has a long history of problems with submersed aquatic vegetation. The lake was impounded in 1965 and the first drawdown was conducted in 1971 to control submersed vegetation. Vegetation abundance is inconsistent and associated with fluctuations in water levels and turbidity. Since 2001, Cotile Lake has been plagued by hydrilla. At one point in the early 2000's, approximately 40% of the lake was covered with submersed vegetation, primarily hydrilla.

Substrate

Cotile Lake receives minimal sedimentation from its watershed. The majority of the watershed is in timber production. There is minimal row crop agriculture in the watershed. The lake bottom substrate consists primarily of coarse and medium grain sands which provide excellent spawning areas for nesting fish.

Artificial Structure

LDWF has not placed artificial structure in Cotile Lake. Crappie fishermen sink tree tops and brush in selected areas as fish attractors. Additional manmade structures are in the form of boat docks and piers.

CONDITION IMBALANCE / PROBLEM

Cotile Lake provides watershed protection, agriculture irrigation, and recreational opportunities. The impoundment is relatively infertile, but it does support a healthy population of bass, crappie and bluegill. The game fish population is adequate to maintain recreational angler interest and efforts.

Submersed aquatic vegetation, primarily hydrilla, is rapidly spreading throughout all shallow water areas of the lake. Since 2012, hydrilla acreage has expanded from 200 to over 400 acres.

CORRECTIVE ACTION NEEDED

A 6' to 8' drawdown to reduce hydrilla biomass will be recommended for the summer/fall of 2015.

RECOMMENDATIONS

1. Continue existing harvest regulations until LDWF sampling results indicate that change is appropriate and necessary from a biological perspective or until such time as a change in management strategy is indicated by the collective opinion of Cotile Lake anglers.
2. The LDWF spray crews will spray emergent vegetation in accordance with LDWF Aquatic Herbicide Application Procedures as needed. A mixture of diquat (0.25 gal/acre) and glyphosate with Aqua King Plus (0.25 gal/acre) and Air Cover (12 oz/acre) surfactants will be applied to giant salvinia infestations from April 1 – October 31. Outside of that time frame giant salvinia will be treated with diquat (0.75 gal/acre) and a non-ionic surfactant. Alligator weed will be controlled with imazapyr (0.5 gal/acre) along undeveloped shorelines and with imazamox (0.5 gal/acre) near developed shorelines. Turbulence surfactant (0.25 gal/acre) will be used with these two herbicides to increase efficacy.
3. A fall/winter drawdown is recommended for 2015. Vegetation surveys conducted in 2012, 2013, and 2014 indicate hydrilla coverage is increasing and has spread throughout most of the lake. Numerous complaints from home and camp owners indicate that hydrilla is restricting recreational use of the lake. Hydrilla coverage at this time is greater than 300 acres, the level found in the 2013 vegetation survey. If the drawdown is approved by the governing body (RPPJ), the following recommendations would apply:
 - A. Lower the lake water level at a rate of four (4) inches per day to a maximum of 8 feet below pool stage. This will ensure adequate available water in the lake for irrigation purposes and to support the existing fish population.
 - B. Begin the drawdown in early September after Labor Day to allow for maximum recreational opportunities and minimize the inconvenience to lake users and residents.
 - C. Close the gates no later than January 15, 2016. This will allow the lake time to return to normal pool level prior to the fish spawn and ensure adequate water available for spring/summer irrigation.